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| 10/022,962 | 12/13/2001 | Gerald C. Monagan | 101337-0015 | 4619 |
| 21125 | 7590 | 06/07/2004 | EXAMINER | |
| NUTTER MCCLENNEN & FISH LLP WORLD TRADE CENTER WEST 155 SEAPORT BOULEVARD BOSTON, MA 02210-2604 | | | CHORBAJI, MONZER R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1744 | |

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/022,962

Applicant(s)

MONAGAN, GERALD C.

Examiner

MONZER R CHORBAJI

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/01/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

This final office action is in response to the amendment received on 03/12/2004

REMARKS

1. The terminal disclaimer received on 03/12/2004 has been accepted.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-8 and 12 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5, 9-13, 16 and 19 of U.S. Patent No. 5,601,786 in view of WO 96/37281 and further in view of Chopin et al U.S. Patent No. 6,037,289.

U.S. Pat. 5,601,786 discloses in claims 1,5,9-13, 16, and 19 the applicant's claimed invention as recited in claims 1-8 and 12, except for an air purification system that comprises a housing having a catalytic titanium element and wherein the titanium element having titanium alloys having at least about 50% by weight titanium.

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WO 96/37281 discloses an apparatus for purifying air by means of an activated photocatalyst such as titanium dioxide. The apparatus comprises a housing (1) having an inlet (2) and outlet (4) for circulating air. A circulating means (5) such as a fan is mounted in the housing in order to circulate the air. In the housing is a filler (7) which has a photocatalyst fixed to a fibrous porous support, and an adjacent ultraviolet light source (13) for activating the photocatalyst. The ultraviolet light source also irradiates the air as it passes through the irradiation chamber (see figure 1; page 4, line 8 to page 6, line 8; and page 10, line 26 to page 12, line 2). However, the WO 96/37281 reference fails to teach a titanium element having titanium alloys having at least about 50% by weight titanium.

U.S. Pat. 6,037,289 teaches a coating, which is equivalent to the titanium element having titanium, alloys having at least about 50% by weight titanium (col.10, lines 53-58). Note that alloys are not limited to metals only, it can include non-metals as well. Also, note that percent by weight is the same as percent by mass. Anatase is a form of titanium dioxide that is a titanium alloy having a composition of at least about 50% by mass titanium. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of U.S.Pat. 5,601,786 to include titanium element having a composition of at least about 50% by mass titanium since titanium dioxide exhibits good photocatalytic properties (Chopin et al, col.2, lines 5-7).

4. Claims 9-11 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5, 9-13, 16 and 19 of U.S.

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Patent No. 5,601,786 in view of WO 96/37281 and further in view of Chopin et al U.S. Patent No. 6,037,289 and Schroeder (U.S.Pat. 6,391,272 B1).

With respect to claims 9-11, the ('786) reference fails to teach a plurality of radiation sources each having a different spectrum of radiation and an isolator. The ('281) reference fails to teach a plurality of radiation sources each having a different spectrum of radiation and does disclose an isolator (unlabeled curvy structure in figures 1 and 3 that isolates the UV sources when the device is opened from the back as shown in figure 3). Chopin et al teaches a coating, which is equivalent to the titanium element having titanium, alloys having at least about 50% by weight titanium (col.10, lines 53-58) but fails to teach a plurality of radiation sources each having a different spectrum of radiation. Schroeder discloses a system having a plurality of ultraviolet radiators (14, 14') such that the first radiator (14) emits UV radiation having a wavelength of less than 300 nm. The second radiator (14') emits UV radiation having a wavelength of about 185 nm, which promotes the formation of ozone. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of U.S.Pat. 5,601,786 to add titanium having a composition of at least about 50% by mass titanium to the isolator of Schroeder since titanium dioxide exhibits good photocatalytic properties (Chopin et al, col.2, lines 5-7).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 7, 12 and 13 are rejected under 35 U.S.C. 103(a) as being

unpatentable over WO 96/37281 in view of Chopin et al U.S. Patent No. 6,037,289.

WO 96/37281 discloses an apparatus for purifying air by means of an activated photocatalyst such as titanium dioxide. The apparatus comprises a housing (1) having an inlet (2) and outlet (4) for circulating air. A circulating means (5) such as a fan is mounted in the housing in order to circulate the air. In the housing is a filter (7) which has a photocatalyst fixed to a fibrous porous support, and an adjacent ultraviolet light source (13) for activating the photocatalyst. The ultraviolet light source also irradiates the air as it passes through the irradiation chamber (see figure 1; page 4, line 8 to page 6, line 8; and page 10, line 26 to page 12, line 2). However, with respect to claims 1 and 13, the WO 96/37281 fails to teach a titanium element having titanium alloys having at least about 50% by weight titanium. U.S. Pat. 6,037,289 teaches a coating, which is equivalent to the titanium element having titanium, alloys having at least about 50% by weight titanium (col.10, lines 53-58). Note that alloys are not limited to metals only, it can include non-metals as well. Also, note that percent by weight is the same as

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percent by mass. Anatase is a form of titanium dioxide that is a titanium alloy having a composition of at least about 50% by mass titanium. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of WO 96/37281 to include titanium element having a composition of at least about 50% by mass titanium since titanium dioxide exhibits good photocatalytic properties (Chopin et al, col.2, lines 5-7).

8. Claims 1, 5-8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goswami (U.S.Pat. 5,835,840) in view of Chopin et al (U.S. Pat. 6,037,289).

Goswami discloses a system to disinfect and detoxify indoor duct-transported air. The air purification system can be utilized in combination or independently with a heating or air conditioning duct system. The air purification system (10) includes a housing (18) having an irradiation chamber comprising a bank of lamps (24) and a duct liner (29) coated with a titanium dioxide catalytic element. Also, disclosed is a photocatalyst coated mesh or matrix of surfaces (28). A fan (65) circulates the air through the system so that the air is exposed to the titanium dioxide photocatalyst as well as the irradiation chamber (24). The irradiation chamber comprises a plurality of UV lamps connected to an electrical source by way of electrical leads (25) and (26). The UV rays from lamps (24) strike the mesh (28) or the coated liner (29), which is coated with the titanium catalyst. The UV rays activate the catalyst and cause a reduction of pollutants in the air (see figures 1, 3 and 4, and col.4, lines 6-56). Additionally, the system has particle/aerosol filters (12) for filtering the air as well as heating/cooling coils (56) for either heating or cooling the air as it passes through the air purification system

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(see col.3, line 61 to col.4, line 5). However, with respect to claims 1 and 13, Goswami fails to teach a titanium element having titanium alloys with at least about 50% by weight titanium. U.S. Pat. 6,037,289 teaches a coating, which is equivalent to the titanium element having titanium, alloys having at least about 50% by weight titanium (col.10, lines 53-58). Note that alloys are not limited to metals only, it can include non-metals as well. Also, note that percent by weight is the same as percent by mass. Anatase is a form of titanium dioxide that is a titanium alloy having a composition of at least about 50% by mass titanium. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Goswami to include titanium element having a composition of at least about 50% by mass titanium since titanium dioxide exhibits good photocatalytic properties (Chopin et al, col.2, lines 5-7).

9. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/37281 in view of Chopin et al (U.S.Pat. 6,037,289) and further in view of Schroeder (U.S.Pat. 6,391,272 B) and Goldstein (U.S.Pat. 4,210,429).

With respect to claims 2-3, the ('289) reference fails to teach the following: a power controller, a pollution detector, and a system activator. However, the WO reference does not specifically teach a power source controller capable of communication with an AC power source for a pollution detector and a system activator for selectively powering the radiation source in response to a pollutant indicator signal received from the detector.

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Schroeder discloses a method and apparatus for cleaning exhaust air containing oxidizable pollutants. The system has an exhaust air duct (10) and a first reaction zone (12) in duct (10) where a plurality of ultraviolet radiators (14, 14') is housed. The first radiator (14) emits UV radiation having a wavelength of less than 300 nm. The second radiator (14') emits UV radiation having a wavelength of about 185 nm, which promotes the formation of ozone. The reaction zone (12) is provided with an optical reflective coating (16), which reflects the UV radiation and serves to increase the intensity of the radiation exposure (see column 4, lines 54-67). Alternatively, Schroeder discloses that it is possible to use a catalyst comprising a coating of catalytically active metal oxides provided on a support material such as active carbon, pumice, zeolites or clay. Examples of suitable catalytically active metal oxides include oxides of Mn, Fe, Ni, Ti and/or Zr (see col.3, lines 37-52). Exhaust air leaving the first reaction zone (12) passes into a second reaction zone or chamber (18), which contains a porous bed of an oxidation catalyst (20). Then the air is passed to a third reaction zone (22), which contains at least one corona discharge electrode (24) for ionizing the exhaust air (see column 5, lines 1-15).

Exhaust duct (20) is also provided with an optional pollutant sensor (30), which may be a conventional hydrocarbon sensor, for measuring the pollutant level in the exhaust air. The output sensor (30) is communicated to a regulator (32), which in turn adjusts the power supply (34) of UV radiators (14, 14') to match the output of the radiators to the hydrocarbon concentration in the exhaust air stream for optimum

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operating efficiency and pollutant removal (see column 5, 16-25). Formaldehyde is an example of a hydrocarbon.

Goldstein discloses an air purifier for removing irritating or harmful impurities from the air. The purifier comprises a housing (10) having an inlet (20). Shown in figure 1 is an electrical cord (28) and associated plug (29) for connection to a conventional 110 volt AC outlet. The controls for the air purifier are also shown in figure 1 and are on the front wall (12) of the housing. They include a two-position switch (30), which is an on-off switch, and two-position switch (32), which is a high-low switch for controlling blower speed or blower (42) (see column 3, lines 10-30). Inside the housing is a germicidal chamber (46), which includes germicidal ultraviolet lamps (70) for treating the air (see col.3, lines 45-50 and col.4, lines 26-32).

Therefore, it would have been obvious to one having ordinary level of skill in the art at the time the invention was made to modify the air purifier of WO 96/37281 and include a means of detecting pollutants in the air stream and further powering the ultraviolet radiation sources in response to the detected pollutants as taught by Schroeder, in order to extend the service life of the catalysts and that of the ultraviolet radiators, which would result in a cost savings.

Additionally, it would have been obvious to one having ordinary skill in the art to further modify the air purifier of WO 96/37281 to include a power controller capable of communication with an AC power source as taught by the device of Goldstein, which uses an electrical cord and associated plug for connection to a conventional AC outlet in order to power the air purifier.

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Response to Arguments

10. Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

The ('289) reference is used to show that a coating, which is equivalent to the titanium element having titanium alloy of at least about 50% by weight titanium (col.10, lines 53-58) is known. Note that alloys are not limited to metals only, it can include non-metals as well. Also, note that percent by weight is the same as percent by mass. Anatase is a form of titanium dioxide that is a titanium alloy having a composition of at least about 50% by mass titanium.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

12. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONZER R CHORBAJI whose telephone number is (571) 272-1271. The examiner can normally be reached on M-F 8:30-5:00.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ROBERT J WARDEN can be reached on (571) 272-1281. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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